

REMARKS/ARGUMENTS

Claims 1-38 are pending. Claims 1-38 are subject to restriction requirement. Applicant elects Group I, consisting of claims 1-28. Applicant withdraws claims 29-39 without prejudice. New claims 40 and 41 are added. Claims 10 and 19 are amended.

The Examiner has further restricted claims 1-28 by requiring election of species. Applicant's numbering below corresponds to Examiner's species election requirements listed on the bottom half of page 4 of the Restriction Requirement.

1. Applicant elects an iron-hydrogenase.
2. Applicant elects the segment ADX⁸TIX⁹EE.
3. Applicant elects gene reassembly.
4. Applicant elects a constitutively activated promoter.

Applicant's numbering below corresponds to Examiner's species election requirements listed on the top half of page 5 of the Restriction Requirement.

1. Applicant elects SEQ ID NO: 26.
1. Applicant elects "Exonuclease-mediated Shuffling", as described in U.S.

Patent 6,352,842.

Applicant has added new claims 40 and 41. Both claims recite methods of engineering a cell to produce an increased amount of hydrogen, and as such are within elected Group I. Claim 40 depends from claim 4, and Claim 41 depends from claim 40.

Support for new claims 40 and 41 can be found, for example, in the specification at page 22, paragraph 91, through page 25, paragraph 95. This section of the specification discloses, among other things, a gene reassembly method of producing mutagenized iron hydrogenase sequences involving simultaneous substitution of residues in both the X¹X²X³FX⁴X⁵X⁶GGVMEAAX⁷R segment and the ADX⁸TIX⁹EE segment. Additional support for substituting both segments in the same gene reassembly reaction can be found, for example, in paragraph 94 on page 24, which discloses the gene reassembly reaction also disclosed in figures 13-15. Further support for substituting both segments in the same gene reassembly reaction can be found, for example, in figures 16 and 17, which disclose variants of the X¹X²X³FX⁴X⁵X⁶GGVMEAAX⁷R and ADX⁸TIX⁹EE segments and a diagram of the annealing positions of nucleic acids encoding portions of the X¹X²X³FX⁴X⁵X⁶GGVMEAAX⁷R and ADX⁸TIX⁹EE segments, respectively. Figure 17 discloses, among other things, an annealing

reaction in which the $X^1X^2X^3FX^4X^5X^6GGV$ portion and the $MEAAX^7R$ portion of the $X^1X^2X^3FX^4X^5X^6GGVMEAAX^7R$ segment are encoded by different nucleic acids placed in the same gene reassembly reaction. Portions of these segments of various lengths are also disclosed on page 24, lines 6-7.

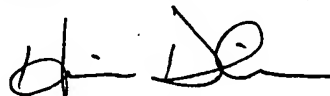
Additional support for claim 41 can be found, for example, in step 4 of figure 13, which depicts more than one nucleic acid sequence encoding at least a portion of a segment of an iron-hydrogenase, wherein the nucleic acids in the gene reassembly reaction contain distinct nucleotide sequences (eg.: nucleic acids 1a, 2a, 3a and 4a in step 3, derived from iron-hydrogenases 1, 2, 3 and 4 shown in step 1).

In a telephone interview on November 21, 2005, the Examiner indicated that reference to claims 47, 52 and 54 in the first paragraph of page 6 was a mistake, and that the list of claims considered generic is different from that listed in the first paragraph of page 6.

The Examiner requests correction of duplicate claim numbering involving claim 36. Applicant has amended the claim numbering to reflect the correct number of claims by altering the claim numbers after the first claim 36. Applicant notes that these renumbered claims are withdrawn.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 650-780-4777.

Respectfully submitted,



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